

**Review of the Madagascan Taeniapterinae (Diptera: Micropezidae),
with the description of a remarkably elongate-legged new genus and
first record of *Rainieria* Rondani from the subregion**

by

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ABSTRACT

An illustrated key to the five named Madagascan genera of Taeniapterinae is presented. *Rainieria* Rondani is recorded from Madagascar and the Afrotropical Region for the first time. The generic limits of *Rainieria* and *Paramimegralla* Hennig are discussed. *Stilissima* is described to accommodate two remarkably elongate-legged new species (*steineri* and *volcanica*) from montane rain-forest in Madagascar. A key to the species of *Stilissima* is provided. The genus is probably the most elongate-legged member of the Taeniapterinae known from the Afrotropical Region and is closely related to *Rainieria* and *Paramimegralla* from Madagascar. A single female (lacking locality data) of an undetermined genus is left undescribed.

INTRODUCTION

The Micropezidae are represented in all major regions, but are predominantly tropical. Most species have dark ground colour and patterned wings, and the body form is long and slender with the mid and hind legs unusually elongate relative to the short front pair. Many species are mimics of Hymenoptera, including Ichneumonidae and less commonly Formicidae (Evenhuis 1989). Adults are predaceous on small insects or are attracted to excrement or decaying fruit; larvae are apparently saprophagous (Evenhuis 1989, Steyskal 1980).

The Afrotropical fauna is dominated by the subfamily Taeniapterinae, which includes 56 of the 58 generically placeable species (Steyskal 1980). The remaining 2 species are known only from Réunion and Mauritius and probably belong in *Cothornobata* Czerny, 1932, a genus of Eurybatinae (McAlpine 1975). All taeniapterine species are restricted to tropical forest in areas of high rainfall and the subfamily is best represented in equatorial and southeast Africa, but is notably absent south of 33° (in South Africa largely confined to the coastal regions of Natal).

The Madagascan Taeniapterinae have been little studied and only four species have previously been recorded from the subregion (two species each of *Mimegralla* Rondani, 1850 and the endemic *Paramimegralla* Hennig, 1937). However, even a limited review of available material suggests a total of at least 13 to 15 species. Of the six African genera, only *Mimegralla* occurs also in Madagascar (and the Comoros); *Rainieria* Rondani, 1843 (previously unrecorded from Madagascar, see below) appears to be an Oriental element in the fauna and almost certainly does not occur in subequatorial Africa.

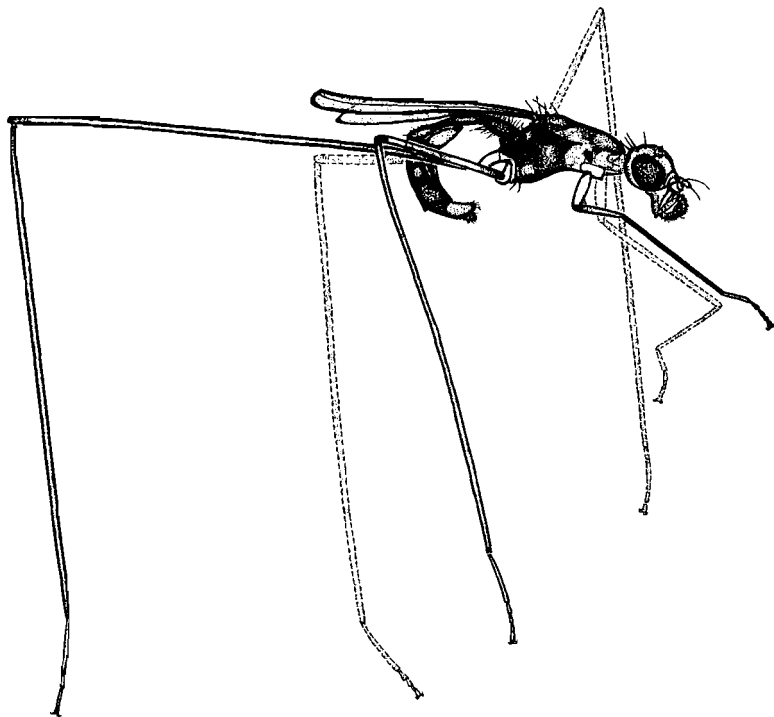


Fig. 1. *Stiltissima volcanica* sp. n., male holotype, lateral habitus.

The initial aim of my research was to describe the remarkable new genus *Stiltissima*, originally collected in northern Madagascar by Dr Brian Stuckenberg in 1957. However, considerable additional research and collation of material was required to meaningfully define and circumscribe *Stiltissima* and related genera. Consequently the following paper identifies and reviews all four Madagascan genera, and will hopefully provide a sound foundation for future taxonomic studies on the Taeniopterinae of Madagascar and the associated Indian Ocean islands.

MATERIALS AND METHODS

This study was based on the examination of pinned adult Taeniopterinae loaned from the following depositories:

Muséum National d'Histoire Naturelle, Paris (MNHN)
Musée Royal de l'Afrique Centrale, Tervuren (MRAC)
Natal Museum, Pietermaritzburg (NMSA)
The Natural History Museum, London (BMNH)
United States National Museum, Washington (USNM)

Morphological terminology is based (with some modification) on McAlpine (1975). Mention should be made of my interpretation of the following features and structures, as these are not necessarily identical to those of previous authors:

Mesofrons. The medial section of the frons bounded by the frontal plates.

Postfrons. A weakly defined region (often bulbous and protuberant) formed by the juncture of the upper occipital region and the posterior margin of the frons.

Profrons. A rather weakly defined prominent region where the frontal plates and parafacials meet adjacent to the antennal insertions.

Propleuron. A small, sometimes indistinctly defined, crescent-shaped sclerite positioned lateroventrally between the pronotum and mesothoracic spiracle. One or several setulae are nearly always present on the ventral margin.

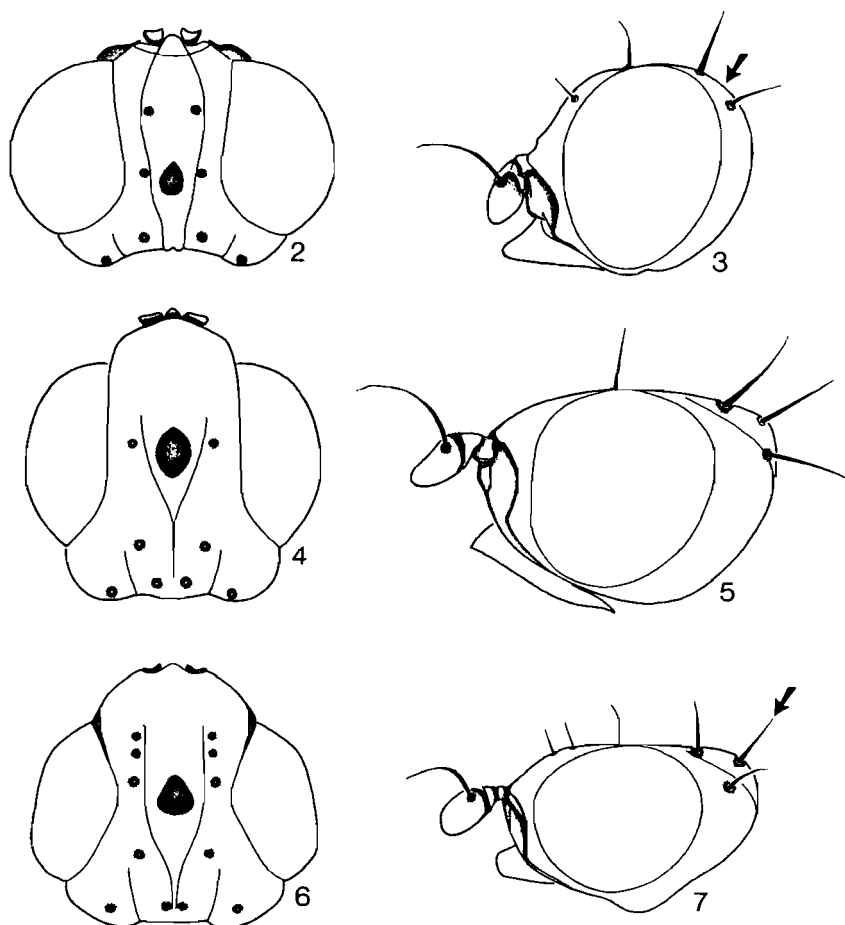
Bilaterally symmetrical structures are described in the singular. The label data of holotypes are quoted exactly as they appear, although supplementary information is sometimes given in parentheses; a slash (/) denotes the end of a line of print and a semicolon separates data quoted on different labels. Holotype measurements are given in parentheses following the range for other specimens examined. Measurements of the head and thorax exclude the antennae; wing length was measured from the humeral crossvein to the wing-tip. All illustrations were drawn personally.

Key to the Madagascan genera of Taeniapterinae

[An undetermined genus is omitted from this key. It is based on a single female in MNHN (coll. A. Seyrig) lacking locality data and in poor condition. More material, including the male, needs to be examined before its relationships can be assessed. It appears to have affinity with *Rainieria*, but differs from *Paramimegralla* and *Rainieria* in having the postfrons strikingly bulbous (distance between posterior margin of eye and posterior extent of postfrons greater than half eye length) and the mesofrons weakly developed (extending only to mid-distance between ocelli and inner verticals).]

- 1 Postvertical seta absent (Fig. 3). Ocelli positioned on mesofrons noticeably closer to insertions of postverticals than antennal bases (Fig. 2)
***Mimegralla* Rondani, 1850**
- Postvertical seta present (eg. Fig. 7). Ocelli positioned on mesofrons at about half distance between antennal bases and insertions of postverticals (eg. Fig. 6) 2
- 2 One pair of fronto-orbital setae inserted adjacent to ocelli (Fig. 4). Propleuron without any setulae along lateroventral margin, at most a few minute hairs present (Fig. 11). Mid and hind legs extraordinarily elongate, male with hind femur reaching 2,5–3,5 × length of thorax (eg. Fig. 1)
***Stiltissima* gen. n.**
- Three pairs of fronto-orbital setae, with anterior 2 pairs inserted well anterior to ocelli (eg. Fig. 6). Propleuron with 1–5 setulae along lateroventral margin (Figs 12 & 13). Mid and hind legs not unusually elongate, male with hind femur at most 2,0 × length of thorax 3
- 3 Propleuron with 1 short (or occasionally 2), inconspicuous short setulae on lateroventral margin (Fig. 12). Male with fore tarsus highly modified, basal 2 segments strikingly compressed in dorsal view (Fig. 15)
***Paramimegralla* Hennig, 1937**

- Propleuron with 2–5 conspicuous (1 always elongate) dark setulae along lateroventral margin (eg. Fig. 13). Male with fore tarsus unmodified, all segments entirely spherical (Fig. 14) **Rainieria** Rondani, 1843



Figs 2–7. Heads of Madagascan Taeniopterinae, showing positions of ocellar triangle and setal insertions (dorsal view) and development/orientation of setae in profile. 2–3. *Mimegralla* sp. (arrow shows absence of postvertical seta). 4–5. *Stiltissima volcanica* sp. n. 6–7. *Paramimegralla* sp. (arrow shows presence of postvertical seta).

***Stiltissima* gen. n.**

Type species: *Stiltissima volcanica* sp. n., by present designation.

Etymology: The generic name refers to the extraordinarily long and spindly legs of the segregate (the suffix *-issima* is intended as a superlative latinised termination).

Description (based on both sexes):

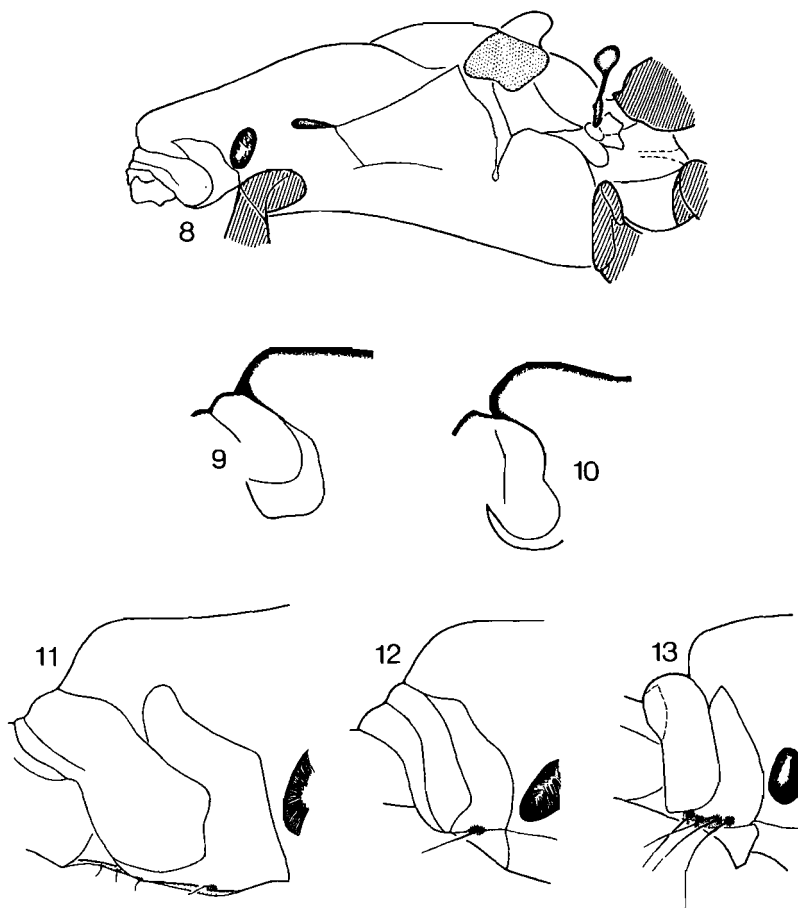
Head (Figs 4 & 5): Longer than high in profile, with well developed postfrons; profrons and facial profile extending markedly anterior to eye, distance subequal to or slightly less than length of antenna. Peristomal margin bare or with short pubescence visible at high magnification only. Prelabrum protruding noticeably in profile. Facial region small but well sclerotised, lower margin just above convexity of prelabrum. Antenna with first and second segments clearly visible in profile, length of third segment $1.3\text{--}1.5 \times$ basal width; arista very slender and entirely bare, only about basal one-tenth slightly swollen. Profrons not modified, not grooved medially or between antennal bases. Ocelli situated about midway between postvertical setae and antennal bases. Mesofrons weakly differentiated on posterior three-fifths of frons, fairly broad anterior to ocelli but sharply narrowed posteriorly near upper occipital margin, pruinescence not or barely visible. Postvertical and both inner and outer vertical setae present; 1 posterior fronto-orbital inserted adjacent or slightly anterior to ocelli.

Thorax (Figs 8–11): Very elongate and slender, markedly so anteriorly, entire profile as in Fig. 8. Propleuron fairly well developed, noticeably differentiated from pronotum, setulae absent along ventral margin, at most a few small hairs developed (Fig. 11). Mesothoracic spiracle fairly well developed, height subequal to or slightly more than length of third antennal segment. Mesonotum not sharply pointed or strongly protruberant anteriorly (Fig. 9), although somewhat bulbous in female (Fig. 10); weakly to moderately developed transverse groove in median section of mesoscutum connects lateral transverse sutures. Scutellum directed slightly upwards, metathorax obliquely angled to abdominal base such that posterior scutellar margin is positioned well anterior to thorax-abdomen junction. Chaetotaxy: 2 notopleurals, 1 supra-alar, 1 postalar, 1 posterior dorsocentral, 2 upwardly directed and subparallel scutellars. Legs unusually elongate, particularly in male. Hind femur $2.5\text{--}3.5 \times$ length of thorax in male, very slender along entire length, subequal to width of mid femur in profile, without ventral spinules. Tarsi unmodified. Wing: R_{2+3} inserted on costal margin at about two-thirds distance between R_1 and R_{4+5} , r-m virtually straight, anal cell acutely angled apically, anal vein at most $1.5 \times$ length of anal crossvein.

Male abdomen: Sternite 1 well developed, entirely sclerotised; sternite 2 (except basal region) and sternites 3–4 greatly reduced. Sternite 5 with spinules, these restricted to inner surface of each lobe (eg. Fig. 18). Cercus and apical margin of epandrium with long hairing.

Affinities:

All five Madagascan taeniapterine genera have only a single well-developed postalar seta, and of these only *Mimegralla* is represented on the African mainland [*Aristobatina* Verbeke, 1951 (southeast Africa) has a single well-developed postalar but differs in lacking inner verticals]. *Mimegralla* differs significantly from the other three genera in having the ocelli positioned noticeably closer to the posterior margin of the frons than the antennal bases, and by lacking postvertical setae. *Stiltissima*, *Paramimegralla*, *Rainieria* and possibly the undescribed genus



Figs 8–13. Thoracic characters of Madagascan Taeniopterinae. 8. *Stiltissima volcanica* sp. n., entire profile (coxae and abdominal base slashed). 9–10. *Stiltissima volcanica* sp. n., anterior section of mesonotum, lateral view. 9. Male. 10. Female. 11–13. Anterolateral section of thorax, showing pronotum, propleuron and propleural setulae. 11. *Stiltissima volcanica* sp. n. 12. *Paramimegralla* sp. 13. *Rainieria* sp.

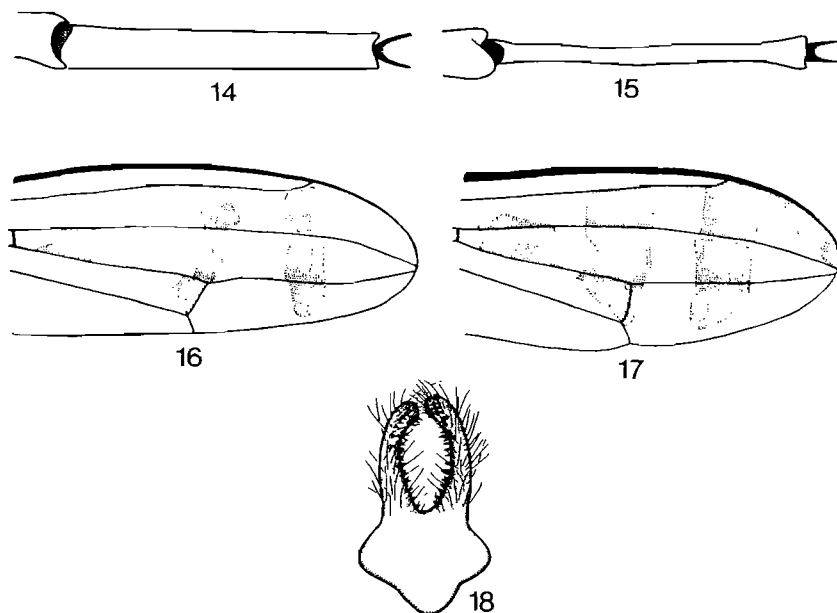
referred to above (all with ocelli about midway between the antennal bases and postverticals) are closely related and appear to represent a distinct lineage within the Old World Taeniopterinae. Some of the endemic Oriental/Australasian genera might be expected to have some affinity, but no relationship has been ascertained (representative species of pertinent genera have been examined).

Although the latter three named genera are very closely related, separate generic concepts are warranted, these being identified in the generic key (see above). *Paramimegralla* is immediately distinguished from the other two genera by having strikingly compressed male fore tarsi and unlike *Stiltissima* has three fronto-orbital setae (as apposed to one). *Rainieria* is similarly distinguished from *Stiltissima* by having three fronto-orbitals, and also well-developed propleural setulae. The development of propleural setulae is consistent within—and helps

define—each generic segregate. These are well developed in *Rainieria* (Fig. 13), reduced to a single (usually) short setula in *Paramimegralla* (Fig. 12) and are absent in *Stiltissima* (Fig. 11). A distinctive row of inconspicuous short setulae occurs in the undetermined genus. *Stiltissima* appears to be the only Afrotropical genus lacking propleural setulae, and this may be an autapomorphy.

Stiltissima has extraordinarily elongate mid and hind legs in the male, this correlating with the unusually elongate and slender thoracic facies. The hind femur is 2,5–3,5 \times thoracic length, being considerably longer than that of all related genera, in which the femur is at most 2,0 \times thoracic length. It is almost certain that *Stiltissima* has longer legs than those of all other Afrotropical taeniapterine genera.

In conclusion the possible relationships between *Stiltissima* and four generically unplaced species of Afrotropical Micropezidae (see Steyskal (1980)), need to be assessed, particularly since two of them have an Indian Ocean island provenance [*Calobata* (sic) *apicalis* and *Calobata* *trinotata*, both described from Réunion by Macquart (1851)]. I have examined the original descriptions of these species and both can immediately be excluded from *Stiltissima*. The remaining two nominal species (both described in *Calobata* and with unknown type localities) are highly unlikely to have been collected from montane Madagascan rain-forest. Note that *Calobata* Meigen is a Palaearctic genus and none of the above species could feasibly belong there.



Figs 14–18. Characters of Madagascan Taeniapterinae. 14–15. Male fore basitarsus, dorsal view. 14. *Rainieria* sp. 15. *Paramimegralla* sp. 16–18. *Stiltissima* gen. n. 16. *S. volcanica* sp. n., wing. 17. *S. steineri* sp. n., wing. 18. *S. volcanica* sp. n., male sternite 5, showing spinules and hairing.

Key to species of *Stiltissima*

- 1 Mesofrons without noticeable pruinescence. Fronto-orbital seta positioned just posterior to foremost ocellus in profile. Wing membrane hyaline or narrowly and indistinctly brown adjacent to costal margin between R_{2+3} and R_{4+5} (Fig. 16). Mid coxa yellow-brown. Mid and hind femora with indistinct darker banding in male **volcanica** sp. n.
- Mesofrons with thin pale brown pruinescence. Fronto-orbital seta positioned just anterior to foremost ocellus in profile. Wing membrane distinctly brown adjacent to costal margin between R_{2+3} and R_{4+5} (Fig. 17). Mid coxa black. Mid and hind femora with 2 well delineated dark bands on apical two-thirds in male **steineri** sp. n.

Stiltissima steineri sp. n.

Fig. 17

Holotype: MADAGASCAR: 'Madagascar: Prov. / Fianarantsoa, 7 km / W Ranomafana [21°15'S:47°25'E], 1100 m / 8–21 October 1988 / W. E. Steiner'; 'Malaise trap in / small clearing, / montane / rain forest'; 'HOLOTYPE ♂ / *Stiltissima steineri* / Barraclough'. In USNM.

Etymology: This species is named in gratitude for Warren E. Steiner, who collected the type series.

Male: Dimensions: Head/thorax (5,7) mm; wing (7,3) mm.

Colour/Pruinescence (Fig. 17): Generally very dark brown to black with metallic sheen on darkest sections, surface sometimes with thin silver or brown pruinescence, most noticeably on mesopleuron and sternopleuron (silver) and on mesonotum (brown). Head with pruinescence restricted to mesofrons (pale brown) and postfrons (silver); lower half to two-thirds of occiput, and gena, proboscis, prelabrum, palp, parafacial, entire facial region, profrons and antenna (much of arista excepted) yellow-brown to orange. Thorax almost entirely dark, metathorax black; brown pruinescence fairly dense on posterolateral sections of mesonotum, but no vittae evident; fore leg mostly yellow-brown, except tibia and apical 4 tarsal segments medium to dark brown and femur with fairly distinct brown band on apical half; mid and hind legs (excluding black mid coxa) pale, femora yellow-brown with 2 distinct dark bands on apical two-thirds and apical band as much as twice length of basal band, tibiae and tarsi brown to black (hind basitarsus always dark). Sternopleural vestiture mostly dark. Wing with 2 dark brown transverse bands on apical half and cell R_5 distinctly and broadly brown across basal section; membrane adjacent to costal margin between R_{2+3} and R_{4+5} noticeably brown, this dark margin much broader nearer to R_{4+5} (Fig. 17). Abdomen black, except epandrium and cerci dull yellow-brown.

Head: Parafacial with lower extremity very inconspicuously haired. Fronto-orbital setae well developed, about two-thirds strength of inner verticals, positioned just anterior to foremost ocellus in profile. Mesofrons excavate below level of frontal plates; pruinescence fairly conspicuous, particularly posteriorly. Antenna inserted about level with eye centre in profile. Face with numerous dorsal hairs.

Thorax: Prosternum with subquadrate outline, although broader anteriorly. Dorsocentral seta very well developed, longer than postalar. Hind tibia with moderately developed dorsal setulae differentiated along much of length. Wing with cell R_5 narrowly open, distance along costal margin between R_4 and R_5 about $0,3 \times$ length of r-m.

Sternite 5: Not dissected from holotype (only known male).

Female: Dimensions: Head/thorax 6,2 mm; wing 8,3 mm.

Similar to male, but differs as follows: Fore femur with indistinct brown band on apical half; mid and hind femora entirely yellow-brown, lacking dark bands; mid and hind tibiae pale brown.

Other material examined: MADAGASCAR: 1 ♀ (paratype), same label data as holotype (USNM).

Stiltissima volcanica sp. n.

Figs 16, 18

Holotype: MADAGASCAR: 'Madagascar-Nord / Montagne d'Ambre [12°30'S: 49°10'E] 1000 m / dct Diégo-Suarez [now Antseranana] / 23.XI.-4.XII.57 B. Stuckenberg'; 'J. Verbeke det., 1970 / Paramimegralla / (Hennig) / tipuliformis sp. n.'; 'HOLOTYPE ♂ / *Stiltissima volcanica* / Barraclough'. In NMSA.

Etymology: The species name refers to the volcanic nature of the type locality.

Male: Dimensions: Head/thorax 4,7–7,8 (7,1) mm; wing 6,0–9,4 (8,6) mm.

Colour/Pruinescence (Fig. 16): Generally dark brown to black with metallic sheen on darkest sections, surface usually lacking pruinescence, at most fairly thin (silver or brown) on mesonotum. Head almost entirely without pruinescence; lower occipital region, and gena, much of proboscis, prelabrum and palp, parafacial, entire facial region, profrons and antenna (arista excepted) yellow-brown to orange. Thorax entirely dark, metathorax dark brown, sometimes with blue-green metallic sheen at certain angles; silver to brown pruinescence fairly dense on posterolateral sections of mesonotum, but no vittae evident; fore leg mostly yellow-brown, except tibia and apical 4 tarsal segments brown to black and femur with indistinct brown band on apical half; mid and hind legs (including coxae) pale, femora yellow-brown with indistinct darker banding, tibiae and tarsi pale brown (hind basitarsus sometimes partly or entirely cream). Sternopleural vestiture partly or predominantly pale. Wing with 2 dark brown transverse bands on apical half and cell R_5 faintly and narrowly brown across basal section; membrane adjacent to costal margin between R_{2+3} and R_{4+5} sometimes very faintly brown, this not or barely visible to naked eye (Fig. 16). Abdomen dark brown to black, except epandrium and cerci yellow-brown to orange.

Head: Parafacial with lower extremity virtually bare. Fronto-orbital setae well developed, almost three-quarters strength of inner verticals, positioned just posterior to foremost ocellus in profile. Mesofrons excavate below level of frontal plates; pruinescence absent or barely visible. Antenna inserted just above level of eye centre in profile. Face with a few minute dorsal hairs.

Thorax: Prosternum with anteriorly lanceolate outline. Dorsocentral seta very well developed, longer than postalar. Hind tibia with minute dorsal setulae differentiated along part or much of length. Wing with cell R_5 narrowly open, distance along costal margin between R_4 and R_5 0,3–0,5 \times length of r-m.

Sternite 5: Shape, outline and vestiture as in Fig. 18.

Female: Dimensions: Head/thorax 6,1–7,0 mm; wing 8,0–9,0 mm.

Similar to male, but differs as follows: Fore femur entirely pale, only apical 3 segments of fore tarsus dark; abdominal tergites 2–4 with thin silver pruinescence.

Other material examined: MADAGASCAR: 4 ♂ 1 ♀ (paratypes), same label data as holotype (NMSA); 1 ♀, Montagne d'Ambre, Station 79, v.1972, Alluaud & Jeannel, 800 m (MNHN).

Remarks: This species is known only from the type locality. Montagne d'Ambre is a montane volcanic region in the extreme north of Madagascar, about 20 km southwest of Diégo-Suarez (Antseranana). According to Stuckenberg (*pers. comm.*), the type series was collected from humid rain-forest in a volcanic crater. The specimens were sitting inactively on the upper surface of leaves, such that they could be collected by hand. The altitude (1000 m) and high rainfall (Donque 1972) are comparable to that of the type locality (also rain-forest) of *S. steineri* in Madagascar.

Comments on the genera *Paramimegralla* and *Rainieria*

Paramimegralla is a small endemic Madagascan genus, previously known only from the holotypes of the two described species. I have examined the type species (*madagascariensis* Hennig, 1937) and material of four additional species, at least three of which are undescribed. The genus is very closely related to *Stiltissima* and *Rainieria* (as noted above), but is well defined by the strikingly compressed male fore tarsi and the weakly developed propleural setulae in all species. The development of three pairs of fronto-orbital setae appears to be a good generic character.

Rainieria is a widespread genus, previously unrecorded only from the Afrotropical and Australasian Regions. There are at least three Madagascan species, which although with head profiles quite unlike the Palaearctic, Nearctic and Neotropical material I have seen (including the type species), are nevertheless in my opinion congeneric. The Madagascan species are deposited predominantly in USNM and NMSA and share the following character states with the extralimital material: ocelli anteriorly displaced, although not necessarily anterior to posterior fronto-orbital seta; mesofrons usually, at most, half frons width; anterior fronto-orbital setae positioned on frontal plates (not mesofrons) or virtually so; postvertical setae present; propleural setulae very well developed (see also Aczél (1959)).

ACKNOWLEDGEMENTS

I am greatly indebted to Allen Norrbom and Warren Steiner (USNM) for the loan of an important collection of Madagascan Taeniopterinae, and also for sending me representative species of Oriental genera and the genus *Rainieria* for comparison. John Chainey (BMNH) kindly loaned me the holotype of *Paramime-*

gralla madagascariensis (type species of *Paramimegralla*) and additional Oriental material. Loïc Matile sent me all undetermined Madagascan Micropezidae from MNHN. Dr B. Stuckenberg provided me with information on the type locality of *Stiltissima volcanica*.

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